

REMARKS

Reconsideration and allowance of this application are respectfully requested. Claims 1, 5 and 7 have been amended¹. Claims 1-12 are pending in the application. The rejections are respectfully submitted to be obviated in view of the remarks presented herein.

Rejection of Claims 1, 5 and 7

Claims 1, 5 and 7 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over the Applicant Admitted Prior Art in view of Teng et al. (U.S. Patent Number 5,285,280; hereinafter “Teng”). The rejection is respectfully traversed.

Regarding independent claim 1, the claimed invention relates to an apparatus for adjusting filter tap length of an adaptive equalizer. The apparatus includes a multipath detector and a tap length adjusting unit. The multipath detector detects multipath information from a difference between the correlation values of input data applied to the adaptive equalizer and a training sequence, and an auto correlation value of a training sequence when the training sequence is valid. The tap length adjusting unit generates a tap length control signal based on positions of the pre-/post-ghosts farthest from a main tap by using the detected multipath information and a field sync signal.

Turning to the cited art, the Description of the Related Art section of the present application describes a data frame of a vestigial side band transmission system as shown in Figure 1a. Additionally, a data field sync segment is described as shown in Figure 1b. In an

¹ Support for the claim amendments is found in the specification on at least page 13, lines 6-14.

adaptive equalizer, the number of taps “is generally determined by the maximum range of ghosts to be canceled” (page 2, lines 16-18). Conventionally, 63 symbol sequences in which symbols of training sequences are alternately reversed have been used to detect and cancel ghosts (page 2, lines 18-20). This conventional detection and cancellation method suffers from a very limited range and a delayed ghost detection time due to the properties of the sequences (page 3, lines 3-15).

Examiner maintains that the combination of Applicant Admitted Prior Art and Teng teaches each feature of the claimed invention. However, Prior Art Figures 1a and 1b solely teach a structure of a data frame. Furthermore, the Description of the Related Art section only generally mentions that the number of taps of the adaptive equalizer is generally determined by the *maximum range* of ghosts to be canceled. Although this determination of the number of taps is determined by a *maximum range* of ghosts to be canceled, the determination as described in the Description of the Related Art section still only refers to a maximum range. The maximum range as described is a range of values only, which is different than “positions of the pre-/post-ghosts farthest from a main tap” as claimed. The claimed invention generates a tap length control signal based on these specific positions which are relative to a location of a main tap, not merely an arbitrarily defined range. Although a range may be specified in the Description of the Related Art, the specific positions of the farthest pre-/post-ghosts some distance farthest from a main tap are not taught or suggested. The range disclosed in discussion of the related art merely suggest *a distance from the first ghost to the last ghost*, and such a distance does not

teach or suggest the claimed positions of particular pre-/post-ghosts which are located at the positions farthest from a main tap.

The Examiner has suggested on page 2 of the Advisory Action dated March 3, 2006, that “one of ordinary skill in the art would recognize that the farthest pre-/post ghosts represent the maximum range of ghosts (multipath signals) and not an arbitrary range.” However, Applicant respectfully submits that the maximum range of ghosts to be canceled (as recited in the Description of the Related Art section) does not teach or suggest “the positions of the pre-/post-ghosts farthest from a main tap” (as recited by claim 1) because the disclosure of a maximum range of ghosts to be canceled does not suggest actual positions of pre-/post-ghosts farthest from a main tap. A range is a measured value of distance, which is completely different from positions of ghosts, as claimed. Thus, making a determination based on a range value would as shown in Prior Art Figures 1a and 1b not teach or suggest a generation of a tap length control signal based on positions of pre-/post-ghosts farthest from a main tap by using detected multipath information and a field sync signal.

Therefore, there is no teaching or suggestion in the Description of the Related Art section of an apparatus for adjusting a filter tap length for an adaptive equalizer based on positions of the pre-/post-ghosts farthest from a main tap by using detected multipath information (wherein the multipath information is detected from a difference between the correlation values of input data applied to the adaptive equalizer and a training sequence, and an auto correlation value of a training sequence when the training sequence is valid) and a field sync signal, as recited in the claim 1.

As previously mentioned, the Examiner also readily admitted in lines 1-3 of page 6 of the Office Action that the Description of the Related Art section does not disclose determining the correlation values so as to adaptively adjust the equalizer tap length.

Teng does not remedy the deficiencies of the Description of the Related Art section. Teng teaches the cancellation of ghosts in a received video signal by using a tap coefficient signal computed by dividing an auto-correlation of an ideal ghost cancellation reference (GCR) signal by the cross-correlation of the ideal and received GCR signals (column 4, lines 29-40). The tap coefficients are transferred to a FIR filter which filters the received video signal with these coefficients to cancel nearby ghosts (column 6, lines 49-52). Additionally, a prior art ghost canceling channel equalizer as shown in Figures 2(b) and 2(c) is also described. A received GCR signal is extracted from a received video signal and compared to an ideal GCR signal. Based on a discrepancy between the received and ideal GCR signals, tap coefficients are generated and used in a transversal filter for canceling ghosts (column 2, lines 12-32).

However, there is also no teaching in Teng of a generation of a tap length control signal based on positions of the pre-/post-ghosts farthest from a main tap by using the detected multipath information and a field sync signal. The claimed invention adjusts a tap length **based on the detected multipath information from the specific relationship and functions**, as claimed. This and the distinguished generation of the tap length control signal based on **positions** of the pre-/post-ghosts **farthest from a main tap** by using the detected multipath information and a field sync signal, are not rendered obvious by the Description of the Related

Art section in view of Teng. At least by virtue of the aforementioned differences, the invention defined by claim 1 is patentable over the Applicant Admitted Prior Art in view of Teng.

Regarding independent claim 5, this claim relates to a method for adjusting filter tap length of an adaptive equalizer corresponding basically to apparatus claim 1. The combination of the Description of the Related Art section and Teng fail to teach at least the determination of a required filter tap length by detecting positions of pre-/post-ghosts farthest from a main tap using the detected multipath information. The deficiencies of the Description of the Related Art section and Teng are described above. At least by virtue of the aforementioned differences, the invention defined by claim 5 is also patentable over the Applicant Admitted Prior Art in view of Teng. Claim 7 is a dependent claim including all of the elements of independent claim 5, which, as established above, distinguishes over the Applicant Admitted Prior Art in view of Teng. Reconsideration and withdrawal of the rejection under 35 U.S.C. § 103(a) are respectfully requested.

Rejection of Claims 2, 6 and 8-12

Claims 2, 6 and 8-12 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over the Applicant Admitted Prior Art in view of Teng et al. in further view of Whitaker (tvhandbook.com: ATSC DTV Receiver Systems; Chapter 17.2) in further view of “www.thefreedictionary.com.” The rejection is respectfully traversed.

The combination of the Description of the Related Art section and Teng do not teach every element of the claimed apparatus and method for adjusting filter tap length as recited in claims 1 and 5. Additionally, as admitted by Examiner in paragraph 4 of the Office Action, the

Applicant Admitted Prior Art in view of Teng does not disclose a first and second multiplexer for enabling the input data and reference signal when the sync signal is “high.” Whitaker and “thefreedictionary.com” do not remedy these deficiencies.

Whitaker discloses data field sync detection by comparing each received data segment from an A/D converter with ideal field 1 and field 2 reference signals to obtain a symbol-by-symbol difference in a receiver as shown in Figure 17.2.6 (section 17.2.2e). An equalizer compensates for ghosts by using a least-mean-square (LMS) algorithm to compute adjustment of filter taps. A generated estimate of error is correlated with various delayed data signals, with the correlations corresponding to the adjustment needed to be made for each tap to reduce the error at the output (section 17.2.2g). Equalizer training signals consisting of pseudonoise sequences are major parts of the data field sync. The equalizer training signals are made up of 700 symbols (511+63+63+63), as shown in Figure 17.2.15 (section 17.2.2l). The Examiner has cited “thefreedictionary.com” solely to offer a definition of a multiplexer, such that “a two input multiplexer is a simple connection of logic gates whose output Y is either input A or input B depending on the value of a third input S which selects the input.”

However, there is no teaching in either Whitaker or “thefreedictionary.com” of at least “a tap length adjusting unit for generating a tap length control signal based on positions of the pre-/post-ghosts farthest from a main tap by using the detected multipath information and a field sync signal,” as recited by claim 1, or of at least “determining a required filter tap length by detecting positions of pre-/post-ghosts farthest from a main tap using the detected multipath information,” as recited by claim 5. There is no mention in Whitaker or “thefreedictionary.com”

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of determining or adjusting a tap length using positions of pre-/post-ghosts farthest from a main tap. Additionally, the equalizer training signals of Whitaker are made up of 700 symbols. On the other hand, the claimed training sequence/reference signal is 704 symbols. Such a 704 symbol training sequence /reference signal is essential in operation of this particularly claimed exemplary embodiment of the present invention. At least by virtue of the aforementioned differences, the invention defined by claims 2 and 6 are patentable over the Applicant Admitted Prior Art in view of Teng in further view of Whitaker in further view of "thefreedictionary.com." Reconsideration and withdrawal of the rejection under 35 U.S.C. § 103(a) are respectfully requested.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

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Respectfully submitted,



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